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10/522,428

10/24/2005

Girish G Parekh

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EXAMINER

JACOBSON, MICHELE LYNN

ART UNIT

PAPER NUMBER

1794

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/522,428	Applicant(s) PAREKH ET AL.	
	Examiner MICHELE JACOBSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-23 and 25-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-23 and 25-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7, 9-23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Heyenk et al. International Publication Number WO 98/47974 (hereafter referred to as Heyenk) as evidenced by Parekh et al. U.S. Patent No. 6,235,102 (hereafter referred to as Parekh) and Fakirov et al Journal of Polymer Science: Part B, Vol. 37 pgs. 1413-1419 (hereafter referred to as Fakirov).

1. Heyenk teaches a resin comprising a mixture of at least two polymers wherein at least one polymer has a glass transition temperature (T_g) greater than about 45° C. (Pg. 1, line 29-Pg. 2, line 2). The polymers are preferably polyesters with molecular weights between 2000 and 15000 and a difference in glass transition temperatures greater than 5° C. (Pg. 2, lines 5-12) Generally, the second polymer has a dry solids content between 30% and 100% and T_g less than 40°C, preferably a dry solids content of at least 50% and T_g less than 10°C. (Pg. 2, lines 22-30) The weight proportion of the polymer having a T_g higher than 45° C is at least 25% (relative to the polymers). (Pg. 3, lines 21-23) The acid numbers of the polyesters range between 0-100 mg of KOH/g of resin and the hydroxyl numbers of the polyesters range between 0-150 mg of KOH/g of resin. (Pg. 3, line 30-Pg. 4, line 2) The polymer mixture according to the invention has

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to be cured with a crosslinker of which amino resin crosslinkers such as benzoguanamine, melamine and urea-formaldehyde resins are recited. The amino resin cross linkers are recited to be present in amounts of between 5-40 wt %. (Pg. 4, lines 7-8, 26-30) Crosslinkers containing isocyanate groups are also recited to be useful. (Pg. 4, lines 11-12) The crosslinkers recited can be selected depending on the desired use of the coating. (Col. 2, lines 32-33)

2. The coating of the invention is recited to be useful as interior or exterior coatings for beer cans, cans for other beverages and can ends made of substrates such as aluminum. (Pg. 8, lines 23-28) Methods such as the drawn-redrawn or draw-wall ironed methods are recited for production of the cans. (Col. 4, lines 33-34)

3. Suitable polyalcohols for preparing the polyesters are recited to include ethylene glycol, diethylene glycol, butanediol (1,4), hexanediol (1,6), neopentyl glycol, 2-methyl-1,3-propanediol, 1,3-butanediol, 1,3-propanediol, 1,2-propanediol, 2-ethyl-2-butyl-1,3-propanediol, trimethylpentanediol, hydroxypivalic neopentyl glycol ester, tricyclodecane dimethanol, cyclohexane dimethanol, bisphenol A bishydroxyethyl ether, trimethylolpropane and/or pentaerythritol.

4. Parekh teaches that bisphenol monomers (e.g. bisphenol A) and glycidyl ether monomers (e.g. BADGE) are present in can coatings that use epoxy or phenolic resins. (Col. 2, line 54-Col.3, line26) Parekh also teaches the addition of an acrylate copolymer having pendant glycidyl groups and to an acid-terminated polyester in a nonaqueous carrier in order to produce a compound that effectively inhibits corrosion of ferrous and nonferrous metal substrates such as aluminum upon curing and cross linking. (Col. 5,

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lines 30-32, lines 40-50) The coating composition is also free of glycidyl ether and bisphenol monomers such as BADGE and bisphenol A. (Col. 5 lines 32-37) The coating composition is recited to comprise (a) about 50% to about 90% by weight of an acrylate copolymer having pendant glycidyl groups and (b) about 10% to about 50% by weight of an acid-terminate polyester. The coating composition is prepared by simply admixing the copolymer, the polyester, and any optional ingredients, in any desired order, in the non-aqueous carrier, with sufficient agitation. (Col. 13, lines 41-45)

5. The motivation to combine the teachings of Parekh with the composition of Heyenk would have been to improve the corrosion barrier properties of the coating composition of Heyenk. The composition of Parekh inhibits the corrosion of metals by simply admixing the acrylate copolymer with pendant glycidyl groups with polyester. It follows that the addition of acrylate copolymer with pendant glycidyl groups would therefore improve the corrosion barrier properties of other polyesters.

3. Fakirov teaches that the hardness of polymers increase with an increase in the glass transition temperatures of the polymers. (Fig. 1) Polyester samples are specifically recited as examples of the increase in hardness that can be achieved with an increase in the glass transition temperature of these polymers. (Table II)

4. As evidenced by Fakirov, it is well known in the polymer art that increasing the glass transition temperature of a polymer increases the hardness of the polymer. Coatings such as those recited by Heyenk must display durability when they are used on the interior and exterior of cans as recited in order to resist damage, yet must also not be so hard as to be brittle. Heyenk already discloses that the Tg of the high Tg

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polyester component of the blend is greater than 45° C. In order to increase the durability of the coating recited by Heyenk, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized the glass transition temperature of the high glass transition temperature polyester component of the blend recited by Heyenk. Heyenk discloses the use of a polyester with a Tg greater than 45° C, while the present claims require a Tg greater than 50° C.

5. Additionally, it is apparent that the instantly claimed amount of $T_g \geq 50^\circ \text{C}$ and that taught by Heyenk are so close to each other that the fact pattern is similar to the one in In re Woodruff, 919 F.2d 1575, USPQ2d 1934 (Fed. Cir. 1990) or Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed.Cir. 1985) where despite a “slight” difference in the ranges the court held that such a difference did not “render the claims patentable” or, alternatively, that “a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough so that one skilled in the art would have expected them to have the same properties”.

6. In light of the case law cited above and given that there is only a “slight” difference between the amount of $T_g \geq 45^\circ \text{C}$ disclosed by Heyenk and the amount disclosed in the present claims, it therefore would have been obvious to one of ordinary skill in the art that the amount of $T_g \geq 50^\circ \text{C}$ disclosed in the present claims is but an obvious variant of the amounts disclosed in Heyenk, and thereby one of ordinary skill in the art would have arrived at the claimed invention.

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6. The optimization of the invention recited by Heyenk would have resulted in a polymer blend comprising 25 wt % high Tg polyester and 75 wt % low Tg (less than 10° C) polyester. Since the hardness of the resulting coating would also be dependent on the ratio of the lower Tg (softer) polymer to the higher Tg (harder polymer) it would have also been obvious to one having ordinary skill in the art at the time the invention was made to optimize this ratio in order to find the best balance between durability and flexibility for the coating produced. The obvious optimization of the glass transition temperature of the high Tg component and the ratio of the high Tg and low Tg components recited by Heyenk to produce a coating useful for cans would have produced the same invention as that claimed by applicant in claims 1 and 9.

7. The amino resin and isocyanate resin cross linkers taught by Heyenk may be used as an alternative to the epoxy based cross linkers recited depending on the use of the coating. Since it is well known that the side effects of using epoxy cross linkers are undesirable for coatings intended to come into contact with consumables, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize these alternatives as the cross linker. As such, the coating produced would inherently be completely free of bisphenol and glycidyl ether monomers such as BPA, BADGE, BFDGE and NOGE according to applicants' definition as evidenced by Parekh. Heyenk also teaches other polyols in addition to neopentyl glycol so the limitation of the polyol used to make the polyester of claim 6 being substantially NPG free is obviated. A can coating produced by these obvious modifications to Heyenk would comprise a polyester resin with a molecular weight of between 2000 and 15000 comprising 10-30

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wt % amino resin crosslinker, the polyester resin comprising a polyester with a Tg less than 25° C and an optimized polyester with a Tg greater than 50°C and completely free of BPA, BADGE, BFDGE, NOGE and NPG which is the same as the invention as claimed in claims 1-7, 10 and 15.

8. Regarding claims 11 and 12: The ranges for acid and hydroxyl number recited by Heyenk encompass the ranges recited by applicant in claims 11 and 12. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized these values in order to achieve the most desired properties for the coating produced.

9. Regarding claims 13, 14 and 26: Since the polymer of Heyenk is recited to be comprised of 5-40 wt % amino resin crosslinker and no other mandatory additives the rest is comprised of 60-95 wt % polyester as claimed in claims 13 and 26. The range claimed in claim 14 is obviated by Heyenk since in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed.Cir. 1990). (MPEP 2144.05)

10. Regarding claims 16 and 17: It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added acrylate copolymer with pendent glycidyl groups as disclosed by Parekh to the polyester composition of Heyenk in order to improve the corrosion barrier properties of the coating composition of Heyenk. This addition would have produced the invention as claimed in claims 16 and 17. It would have been obvious to one having ordinary skill in the art at the time the

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invention was made to have optimized the amount of acrylate copolymer added to the polyester composition of Heyenk in order to produce a polymer with beneficial corrosion resistance without diminishing the other properties of the composition. Such an optimization would have produced the same invention as claimed in claim 16.

11. The limitation in claim 18 that the end portion of the can be coated with the composition prior to fabrication is a product by process limitation and is not expected to produce a materially different product from a can end that was coated after fabrication. Since Heyenk specifically discloses the usefulness of the composition recited for coating can ends the limitation of claim 18 is obviated by the optimization of Heyenk. Heyenk also recites the usefulness of the composition for coating both the exterior and interior of cans so the limitations of claim 19 are obviated by the obvious use of the optimized coating of Heyenk for can interior and exteriors.

12. The composition of claim 20 is obviated by Heyenk as explained above and the method recited in claims 20 are well known steps of the drawn-redrawn method of can production recited by Heyenk. It is standard practice to coat a metal substrate with polymer and allow it to cure in the drawn-redrawn method and thus the limitations of claim 21 are obviated by Heyenk. It is well known in the can art to dispose food or beverages in cans and as such it would have been obvious to one having ordinary skill in the art at the time the invention was made to have disposed such products in the can produced by the obvious method of claim 20, which is the same as that claimed in claim 27.

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13. Since the optimized composition recited by Heyenk is the same as that recited by applicant it is the examiner's opinion that it would inherently pass the same amount of current as recited by applicant in claim 22. The composition of Heyenk is recited to be useful for food contact packaging and coating can ends and since it may be synthesized in the absence of epoxy or phenolic resins is inherently substantially free of BPA and aromatic glycidyl ether compounds as recited in claims 23 and 25.

Response to Arguments

7. Applicant's arguments filed 6/16/08 have been fully considered and are considered persuasive as they pertain to the objection under 102(b) set forth in the previous office action.

8. Applicant asserts on page 9 of the remarks that since Heyenk discloses bisphenol A epoxy resin as a preferred cross-linker and that this cross-linker is used in all of the examples disclosed by Heyenk that the composition of Heyenk would include NPG, BPA and aromatic glycidyl ether compounds. However, "applicant must look to the whole reference for what it teaches. Applicant cannot merely rely on the examples and argue that the reference did not teach others." In re Courtright, 377 F.2d 647, 153 USPQ 735,739 (CCPA 1967). As explained above, Heyenk includes embodiments that do not include these compounds.

9. Applicant's assertion on page 10 of the remarks that the composition put forth Heyenk is not recited to be suitable for riveted beverage cans is not germane since applicant does not recited "riveted beverage" cans as a limitation in any of the claims.

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10. Regarding applicant's assertion on page 10 of the remarks that the coating produced by Heyenk would not be expected to pass the test as claimed in claim 22, applicant has failed to provide a reason why one would not expect a satisfactory outcome, nor has applicant provided data to prove that such a coating would not pass this test.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELE JACOBSON whose telephone number is

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(571)272-8905. The examiner can normally be reached on Monday-Thursday 8:30 AM-7 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michele L. Jacobson
Examiner /M. J./
Art Unit 1794

/Carol Chaney/
Supervisory Patent Examiner, Art Unit 1794